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NEW MEXICO GEOLOGY.

IN SCIENCE for June 15, Dr. C. R. Keyes, formerly president of the New Mexico School of Mines at Socorro, gives a general section of the formations of New Mexico. This is a sequel to a series of papers in other scientific journals, particularly the *Journal of Geology*, the *American Geologist* and the *American Journal of Science*, in which he has discussed various aspects of the geology of the territory. These articles treat of phases of the subject of great interest to geologists as bearing on the geology of a field as yet little known, but the author can not well be congratulated on the extent of the contribution he has made to our knowledge of the geology of this region. There are many inaccuracies and the papers are manifestly designed to anticipate the results of investigations rather than as a record of actual observations. Heretofore, Dr. Keyes has maintained there was no evidence that Lower Paleozoic formations were present in New Mexico. He places them in the column now published, however, with thicknesses and lithological characteristics but fails to advise us as to any circumstances concerning their discovery.¹ He gives the Devonian as made up of limestones, whereas, so far as known, they consist entirely of shales.² Limestones and shales are said to constitute the Carboniferous thus neglecting entirely the great body of sandstones contained in the upper division. The distribution of formations shown in the map (plate 7) Water Supply Paper No. 123, U. S. Geological Survey, is considerably at variance with the facts, as is likewise the discussion given there and elsewhere of the faults and unconformities. But discrepancies of this kind are doubtless inevitable in observations made from car windows and through a field glass. A large number of formation names are proposed, but we look in vain for detailed sections or descriptions showing their character and dis-

¹The announcement of the discovery of these formations in New Mexico was first made by L. C. Graton and the writer in SCIENCE for April 13, 1906, p. 590.

²*American Journal Science*, 4th Ser., Vol. 21, p. 394, 1906.

tribution. In this respect the author does not seem to be in accord with leading geologists generally, who maintain that no formation name should be proposed without adequate definition. The correlation of formations in regions widely separated, where detailed maps and careful paleontological studies are wanting, is usually regarded as a hazardous undertaking, but Dr. Keyes does not appear to find it so. If Dr. Keyes has at hand the data upon which these conclusions are based it is to be regretted he has not published them. We are told that this 'correlated scheme of rock succession' is based on information obtained through the work of the "Geological and Mineral Survey of New Mexico under the direction of the School of Mines at Socorro." Unfortunately we have no knowledge of such an organization aside from the mention made of it in this connection. Geologists generally would be interested to know something of an organization carrying on so important a work. It appears to be wholly unknown even in New Mexico.

These exceptions are possibly of no consequence and if his attention were called to them the author would doubtless reply, as in a former instance when the writer of this note reminded him that a fossil he had figured was wrongly named, that it was a 'matter of no importance.'

As a whole the papers on New Mexico geology which issue from the above named writer's pen in such rapid succession abound in inaccuracies, while the absence of detailed description or evidence of careful field work deprives them of any value they might otherwise possess.

C. H. GORDON

U. S. GEOLOGICAL SURVEY,

August 25, 1906

GEOLOGICAL WORK IN ARKANSAS BY PROFESSOR PURDUE

TO THE EDITOR OF SCIENCE: A paragraph in my letter to Doctor Branner, published in the issue of SCIENCE of December 7, is possibly open to misconstruction and may do injustice to Professor Purdue, of the University of Arkansas. The paragraph is as follows:

As to the invasion of fields occupied by professors of geology, there are in the files of the survey many letters to such professors urging them to work up the local geology and offering financial assistance and means of publication of their results. The case of the Fayetteville quadrangle is perhaps an apparent exception. It should be stated, however, that when the work was undertaken there Professor Purdue was practically unknown as a geologist and was, as a matter of fact, not sufficiently experienced to carry on independent work. Since his season with Adams he has been employed each summer and has submitted three folios for publication. It has been necessary, however, in connection with this work, to send more experienced men into the field with him, although he will receive the entire credit for the work.

It was not my intention to cast any reflection, even in a personal letter, upon Professor Purdue's work, the quality of which has been higher than that of most work done for the survey under similar conditions. When he was first entrusted with independent work, however, his field experience was less than is required for the regular members of the survey and his ability in this direction was not known to us. It is for this reason, and not because of any deficiency in the quality of his results that more experienced men have conferred or collaborated with him in the field. This course is, indeed, frequently necessary with regular members of the survey, as well as with per diem men. That Professor Purdue's work is regarded as good is sufficiently shown by the fact that an allotment for its continuance has been made every year since it was begun. A further point in his favor, and one highly appreciated, is that his results are submitted when promised.

CHAS. D. WALCOTT,
Director

SPECIAL ARTICLES

EVIDENCE OF MAN IN THE LOESS OF NEBRASKA

AFTER careful investigation the writer stands ready to announce his belief in the occurrence of human remains in the loess of this state, and for this primitive type he has proposed the name Nebraska loess man.¹

¹ Nebraska Geological Survey, Vol. II., parts 5 and 6.

Such importance attaches to the discovery as to warrant a paper devoted to the geological facts connected therewith.

Physiographic Features.—North of Omaha for a number of miles the topographic features are bold and abrupt for a prairie country due to the proximity of the Missouri River, the relief being 150 to 200 feet.

On all sides landslides are in evidence and must be reckoned with in all field work. Early in October Mr. Robert F. Gilder, of Omaha, opened a mound on Long's hill facing the Missouri River, ten miles north of Omaha or three miles north of Florence, Douglass County, Nebraska. From Florence north to Long's hill there is a continuous section along the roadside for about three miles and from the base of Long's hill to the summit, on which Gilder's mound is situated, there is an unbroken section, hence the geology of the place is well exposed, and being simple is easily interpreted. The public highway, which is about forty feet above the river level, is just upon the top of the Carboniferous, the dark carbonaceous shales of which constitute a distinct geological feature. Upon the shales there rests an average of ten to twenty feet of glacial drift containing occasional Sioux quartzite and granitic boulders. Upon the drift comes 150 feet of bright buff loess such as is conspicuous in and around Omaha and Council Bluffs.

Long's hill stands 200 feet above the river level, and 150 feet above the valley out of which it rises. It is a hill of erosion, and no discoverable land slip has complicated its simple geology. On its summit is Gilder's mound, in the superficial layer of which were found mound-builder remains, and in the deeper layer eight skulls and many bones of a still more primitive type. The writer at once joined Mr. Gilder in a critical investigation of the place, continuing the work from time to time to December 2, 1906, with results leading to the conclusion that two of the skulls are mound builders', in all probability. These were found in the upper layer readily discernible as a mixture of black soil and light buff subsoil such as would result from digging and burying. This layer has a